

What is claimed is:

1. An abnormal oil pressure reduction determination device for use with a transmission of a vehicle, the transmission having an oil pressure control mechanism which performs speed change control using oil pressure, the abnormal oil pressure reduction determination device comprising:

an oil pressure sensor which detects a real oil pressure,

a sensor which detects a vehicle running state, and

a controller which sets an oil pressure command value for the oil pressure control mechanism, the controller comprising a microcomputer, wherein:

the controller functions to:

compute a lower limiting oil pressure which is possible in the vehicle running state,

compare the real oil pressure with the lower limiting oil pressure,

compare the real oil pressure with the oil pressure command value, and

when the real oil pressure is less than the lower limiting oil pressure and when a pressure difference between the real oil pressure and oil pressure command value exceeds a reference value, determine that there is an abnormal oil pressure reduction due to a fault in the oil pressure control mechanism.

2. The abnormal oil pressure reduction determining device as defined in Claim 1, wherein the controller functions to measure a time, and when the pressure difference between the oil pressure command value and real oil pressure continuously exceeds a reference value for a first predetermined time period or longer, functions to determine that there is an abnormal oil pressure reduction.

3. The abnormal oil pressure reduction determining device as defined in Claim 1, wherein the controller functions to count the number of occasions when the pressure difference between the oil pressure command value and real oil pressure continuously exceeded the reference value for the first

predetermined time period or longer, and when the number of occasions is equal to or more than a predetermined count value, functions to determine that there is an abnormal oil pressure reduction.

4. The abnormal oil pressure reduction determining device as defined in Claim 3, wherein the controller further functions to increase the count, only when the situation where the pressure difference between the oil pressure command value and real oil pressure continuously exceeded the reference value for the first predetermined time period or longer, occurred after a second predetermined time has elapsed since a last increment of the count.

5. The abnormal oil pressure reduction determining device as defined in Claim 1, further comprising a sensor which detects a rotation speed of an engine of the vehicle,

wherein the controller further functions to inhibit the determination of the presence of an abnormal oil pressure reduction when the rotation speed of the engine is less than a predetermined rotation speed.

6. The abnormal oil pressure reduction determining device as defined in Claim 1, wherein the controller further functions to inhibit the determination of the presence of an abnormal oil pressure reduction when there is a fault in the oil pressure sensor.

7. The abnormal oil pressure reduction determining device as defined in Claim 1, wherein the vehicle further comprises a shift lever and a sensor which detects the shift lever position, and generates a corresponding range signal, and

wherein the controller further functions to:

determine whether or not an operating range of the transmission is changing based on the range signal, and

when the operating range of the transmission is changing, functions to inhibit the determination of the presence of an abnormal oil pressure

reduction.

8. The abnormal oil pressure reduction determining device as defined in Claim 1, further comprising a sensor which detects an oil temperature,

wherein the controller further functions to inhibit the determination of the presence of an abnormal oil pressure reduction when the oil temperature is less than the predetermined oil temperature.

9. The abnormal oil pressure reduction determining device as defined in Claim 1, wherein the vehicle further comprises a vehicle dynamics control unit which performs spin recovery correction to prevent sideslip of the vehicle, and

wherein the controller further functions to inhibit the determination of the presence of an abnormal oil pressure reduction when the spin recovery correction is being performed.

10. The abnormal oil pressure reduction determining device as defined in Claim 1, wherein the vehicle further comprises a brake switch which detects ON/OFF of the brake, and

wherein the controller further functions to inhibit the determination of the presence of an abnormal oil pressure reduction when the brake switch is ON.

11. The abnormal oil pressure reduction determining device as defined in Claim 1, wherein the vehicle further comprises a shift lever, and a sensor which detects a shift lever position and generates a corresponding range signal, and

wherein the controller further functions to inhibit the determination of the presence of an abnormal oil pressure reduction when the range signal is a neutral range signal.

12. The abnormal oil pressure reduction determining device as defined in Claim 1, further comprising an accelerator pedal stroke sensor which detects

an accelerator pedal stroke and a sensor which detects vehicle speed,

wherein the controller further functions to determine the vehicle running state based on the accelerator pedal stroke and vehicle speed, and

when the vehicle running state is a rapid acceleration state or rapid deceleration state, functions to inhibit the determination of the presence of an abnormal oil pressure reduction.

13. The abnormal oil pressure reduction determining device as defined in Claim 1, wherein the oil pressure control mechanism comprises a pump driven by a rotation of an engine of the vehicle, and wherein a sensor which detects the vehicle running state comprises a sensor which detects a rotation speed of the engine, and

wherein the controller further functions to:

compute the lower limiting oil pressure based on the rotation speed of the engine.

14. An abnormal oil pressure reduction determination device for use with a transmission of a vehicle, the transmission having an oil pressure control mechanism which performs speed change control using oil pressure, the abnormal oil pressure reduction determination device comprising:

means for detecting a real oil pressure,

means for detecting a vehicle running state,

means for setting an oil pressure command value for the oil pressure control mechanism,

means for computing a lower limiting oil pressure which is possible in the vehicle running state,

means for comparing the real oil pressure with the lower limiting oil pressure,

means for comparing the real oil pressure with the oil pressure command value, and

means for determining that there is an abnormal oil pressure reduction due to a fault in the oil pressure control mechanism when the real oil pressure

is less than the lower limiting oil pressure and when a pressure difference between the real oil pressure and oil pressure command value exceeds a reference value.

15. An abnormal oil pressure reduction determination method for use with a transmission of a vehicle, the transmission having an oil pressure control mechanism which performs speed change control using oil pressure, the abnormal oil pressure reduction determination method comprising the steps of:

- detecting a real oil pressure,
- detecting a vehicle running state,
- setting an oil pressure command value for the oil pressure control mechanism,
- computing a lower limiting oil pressure which is possible in the vehicle running state,
- comparing the real oil pressure with the lower limiting oil pressure,
- comparing the real oil pressure with the oil pressure command value, and
- determining that there is an abnormal oil pressure reduction due to a fault in the oil pressure control mechanism when the real oil pressure is less than the lower limiting oil pressure and when a pressure difference between the real oil pressure and oil pressure command value exceeds a reference value.